

Remarks

Applicants thank Examiners Marschel and Galitsky courtesies extended during an interview on June 6, 2002. At the interview, applicants' representative discussed the support in the specification for the recitation "substantial part thereof," in relation to the atomic coordinates of Table 1. The point was made that a person skilled in the relevant art, informed by the present specification, readily would understand the meaning of the quoted phrase. Applicants' representative also discussed the pending Section 101 rejection, explaining that the claimed invention yields concrete and tangible results that are useful to designing compounds that associate with TACE; hence, the claims embody statutory subject matter.

Claims 43, 45-55 and 64-65 have been cancelled, and claims 63 and 66 have been amended. Claims 67-74 have been added, and so claims 41-42, 56-63 and 66-74 are pending.

In compliance with 37 C.F.R. § 1.121(b), Applicants enclose marked up versions of the amended claims, showing all of the relative changes.

I. OBJECTIONS

The examiner objects to the description provided for Figure 2 because it allegedly mentions colors not present in the figure itself. Applicants provide herein formal color drawings and, thereby, obviate the examiner's objection.

II. REJECTIONS UNDER 35 U.S.C. §101

The examiner rejects claims 41-43 and 45-65 under 35 U.S.C. §101, for allegedly being directed to non-statutory subject matter. Applicants respectfully traverse the rejection.

The examiner asserts that the "claims are drawn to methods which only manipulate data, with no concrete application outside of the computer on which the method can be performed." Office Action dated January 11, 2002 ("the January Office Action") at page 3, paragraph 1. This assertion is erroneous as a matter of fact, however.

According to the Federal Circuit, the "question of whether a claim encompasses statutory subject matter should not focus on *which* of the four categories of subject matter a claim is directed to--process, machine, manufacture, or composition of matter--but rather on the essential characteristics of the subject matter, in particular, its practical utility." *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998). The "mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, [does] not render it nonstatutory subject matter." *Id.* at 1374. In fact, the only question is whether the claimed invention produces a "useful, concrete and tangible result." *Id.*

In the instant case, the claimed methodology employs computer models that utilize facts, *i.e.*, atomic coordinates obtained from crystallographical analysis of a catalytic domain of TACE polypeptide, to determine whether a test compound associates with the catalytic domain. Clearly the

data generated from this determination, which can be presented in tabular, graphical, or sterical form, represents concrete and tangible results. Most importantly, however, the determination provides useful information to the practitioner searching for compounds which interact with TACE. Thus, the claimed invention satisfies the patentability test articulated by the Federal Circuit. Accordingly, the rejection should be withdrawn.

III. REJECTIONS UNDER 35 U.S.C. §112, ¶1

The examiner rejects claims 41-42, 45-63 and 66 under 35 U.S.C. §112, ¶1, alleging that the claims are not enabled by the specification. In effort to expedite prosecution, applicants have amended the instant claims, and assert that the amendments obviate the rejection.

IV. REJECTIONS UNDER 35 U.S.C. §112, ¶2

The examiner rejects claims 43, 64 and 65 under 35 U.S.C. §112, ¶2, for allegedly being indefinite. Applicants respectfully traverse the rejection.

According to the examiner, the term "substantial part thereof" is unclear in its reference to atomic coordinates.

The instant claims are directed to methods of identifying compounds that associate with TACE using atomic coordinates that comprise the coordinates of Table 1, or a substantial part thereof, to design an associating compound that forms a bond with a catalytic domain of a TACE polypeptide. An artisan, in view of the specification, would recognize that not all of the atomic coordinates in Table 1 are essential for designing such a compound. For example, the atomic coordinates corresponding to the histidine tag represent processing artifacts and have nothing to do with a TACE catalytic domain (TCD) or the claimed invention. According to WEBSTER'S NEW COLLEGIATE DICTIONARY (1973), the word "substantial" implies that something is "important," "essential," or "ample to satisfy." Thus, in light of the plain meaning of "substantial part thereof," applicants assert that one of ordinary skill in the art would understand readily that the term's instant use describes those atomic coordinates which are "important," "essential," or "ample to satisfy" to the claimed function, *i.e.*, designing a compound that associates with the TACE catalytic domain (TCD).

Moreover, the specification identifies several regions within the TCD that are useful for designing associating compounds. For example, the specification suggests using the atomic coordinates for the S1' or S1'S3' regions to design compounds which associate with a TCD. *See e.g.* Application, page 8, line 21 to page 9, line 4 and page 30, line 26 to page 31, line 7. In addition, since TACE is a zinc endopeptidase, the specification emphasizes the importance of residues which interact with a catalytic zinc. For example, see the specification at page 9, line 10 to page 10, line 21, and at page 24, line 24 to page 25, line 10. Accordingly, the skilled person would recognize that employing atomic coordinates from one or more of these regions would be "ample to satisfy" the claimed invention.

As the metes and bounds of the term would be readily apparent to those skilled in the art, applicants request that the rejection be withdrawn.

V. **DOUBLE PATENTING**

The examiner rejects claims 41, 42, 45, 63 and 66 under the judicially created doctrine of obvious-type double patenting as being unpatentable over claim 15 of U.S. patent No. 5,830,742. Applicants assert that the amendments submitted herein obviate the rejection. The amended claims are directed to methods of identifying compounds that associate with TACE comprising using the atomic coordinates of Table 1, or a substantial part thereof. As the atomic coordinates recited in the claims would not have been obvious to the artisan when the instant application was filed, the doctrine is inapplicable. Accordingly, applicants request that the rejection be withdrawn.

VI. **REJECTIONS UNDER 35 U.S.C. §102**

The examiner rejects claims 41, 42, 45, 63 and 66 under 35 U.S.C. §102(e), for allegedly being anticipated by Black *et al.* (US 5,830,742). In effort to expedite prosecution, applicants have amended the instant claims, and assert that the amendments obviate the rejection.

In view of the foregoing remarks it is believed that the application is in condition for allowance. A favorable disposition of the application therefore is solicited. The examiner also is invited to contact the undersigned if there are any questions or if the examiner believes that further discussion will advance prosecution.

Respectfully submitted,

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Date

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Marked-up Version of Amended Claims

63. (Amended) A method of identifying a compound that associates with tumor necrosis factor- α -converting enzyme (TACE), comprising[:]
(A) using atomic coordinates [obtained from crystallographical analysis of a catalytic domain of a TACE polypeptide] that comprise the coordinates of Table 1 or a substantial part thereof to design an associating compound that forms a bond with [said catalytic domain] a catalytic domain of a TACE polypeptide];, and (B) determining via computer-generated models whether said compound associates with said catalytic domain,

wherein said substantial part comprises atomic coordinates of regions selected from the group consisting of the S1' region, the S1'S3' pocket and atoms which bind a catalytic zinc.

66. (Amended) A method of identifying a compound that associates with tumor necrosis factor- α -converting enzyme (TACE), comprising[:]
(A) using atomic coordinates [obtained from crystallographical analysis of a catalytic domain of a TACE polypeptide] that comprise the coordinates of Table 1 or a substantial part thereof to design an associating compound that forms a bond with [said catalytic domain] a catalytic domain of a TACE polypeptide];, (B) synthesizing said compound];, and (C) determining *in vitro* whether said compound associates with said catalytic domain,

wherein said substantial part comprises atomic coordinates of regions selected from the group consisting of the S1' region, the S1'S3' pocket and atoms which bind a catalytic zinc.